4/23/18

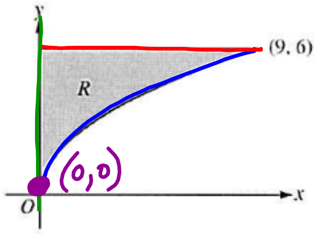
"What goes up doesnt necessarily have to come down."-Unknown

HW: "2017 Calc L31b Area Between Curves" #8
Test 1 on Wednesday 5/2

AIM: More Area Between Curves

Find the POI

$0 = 2\sqrt{x}$
$0 = \sqrt{x}$
$x = 0$



$y = 2\sqrt{x} \leftarrow$ Bottom
$y = 6 \leftarrow$ Top
$x = 0$

5. Let R be the region in the first quadrant bounded by the graph of $y = 2\sqrt{x}$, the horizontal line $y = 6$, and the y-axis, as shown in the figure above.

Find the area of R.

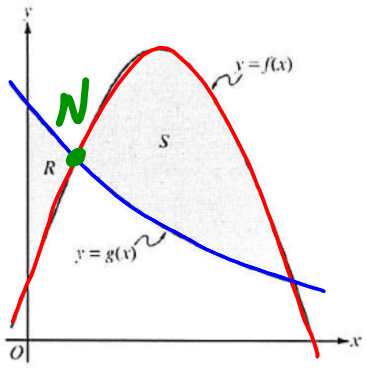
$$\text{Area } R = \int_0^9 \left(6 - (2\sqrt{x})\right) dx$$

NORMAL FLOAT DEC a+bi DEGREE MP
$\int_0^9 (6-(2\sqrt{X}))dX$
17.9999995

$$\text{Area of } R \approx \boxed{18 \text{ units}^2}$$

$f(x) = \frac{1}{4} + \sin(\pi x)$

$g(x) = 4^{-x}$



6. Let f and g be the functions given by $f(x) = \frac{1}{4} + \sin(\pi x)$ and $g(x) = 4^{-x}$. Let R be the shaded region in the first quadrant enclosed by the y-axis and the graphs of f and g, and let S be the shaded region in the first quadrant enclosed by the graphs of f and g, as shown in the figure above.

(a) Find the area of R.

(b) Find the area of S.

a) $$\text{Area } R = \int_0^N \left(4^{-x} - \left(\frac{1}{4} + \sin(\pi x)\right)\right) dx$$

$$\text{Area } R \approx \boxed{.065 \text{ units}^2}$$

b) $$\text{Area } S = \int_N^1 \left(\frac{1}{4} + \sin(\pi x) - (4^{-x})\right) dx$$

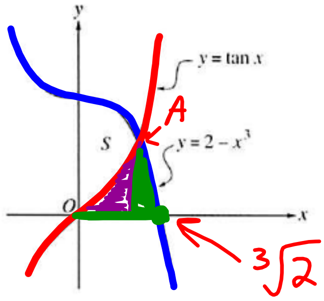
$$\text{Area} \approx \boxed{.410 \text{ units}^2}$$

$y = 2 - x^3$

$0 = 2 - x^3$

$x^3 = 2$

$x = \sqrt[3]{2}$



$y = \tan x$

7. Let R and S be the regions in the first quadrant shown in the figure above. The region R is bounded by the x-axis and the graphs of $y = 2 - x^3$ and $y = \tan x$. The region S is bounded by the y-axis and the graphs of $y = 2 - x^3$ and $y = \tan x$.

(a) Find the area of R.

(b) Find the area of S.

a) $\int_0^A (\tan(x) - 0)\,dx + \int_A^{\sqrt[3]{2}} (2 - x^3)\,dx = \boxed{.729 \text{ units}^2}$

b) $\int_0^A \left(2 - x^3 - (\tan(x))\right)dx = \boxed{1.161 \text{ units}^2}$